REMARKS

The Office Action of April 10, 2007 has been received and its contents carefully considered.

The present Amendment revises all of the independent claims and some of the dependent claims. The Amendment also cancels three dependent claims. The amendments to the independent claims vary from claim to claim, but involve principally recitations concerning a diminishment control circuit in some of the independent claims, recitations concerning the standard deviation in some of the independent claims, and recitations concerning setting a discard end threshold in some of the independent claims.

The claims in this application require three thresholds for controlling reception of packets of voice data: a read start threshold, a discard start threshold, and a discard end threshold. In particular, independent claim 3 now recites that "said discard end threshold is set to a value between said discard start threshold and said read start threshold, and different than either of said discard start threshold and said read start threshold, if said discard start threshold is greater than said read start threshold," and independent claims 4, 9, and 15 have similar limitations. Furthermore, independent claim 3 now recites that "by using a standard deviation of said coded speech data that reflects a jitter distribution of the network and causes a receipt time of the communication packet to vary, said read start point setting circuit sets the read start threshold at a length of the queue that is three times to four times as great as said standard deviation," and independent claims 4, 9, and 15 have similar limitations. These two features are closely related to each other. The first feature is directed to the three thresholds and the positional relationship among them, and the second feature is directed to the position that the read start threshold can take in the queue in relation to the positions of the discard start threshold and the discard end threshold.

The Office Action rejects all of the independent claims based on various combinations of patent 4,707,831 to Weir et al, patent 6,253,207 to Malek et al, patent 4,607,363 to Platel et al, patent 6,091,709 to Harrison et al, and patent 4,769,844 to Fujimoto et al. These references will hereafter be called simply "Platel," "Weir," "Malek," "Harrison,"

and "Fujimoto" for the sake of convenient discussion. For the reasons discussed below, it is respectfully submitted that independent claims 3, 4, 9, and 15, as currently formulated, are patentable over these references.

On pages 2 and 3, the Office Action takes the position that Patel discloses "a read start threshold setting circuit for setting, with respect to a length of the queue, a read start threshold at which the received packets should begin to be read out; (fig. 4, part 12 – counter for counting the number of packets to be read out; col. 8, lines 26-35 – the read start threshold is zero, applicant fails to disclose that the threshold could not be set at zero)." This is incorrect. Even in claim 3 as originally filed (which is part of the original disclosure), it is recited that "said read start point setting circuit sets the read start threshold at a length of the queue that is three times to four times as great as said standard deviation." This standard deviation cannot be zero, so the read start threshold cannot be zero. It is unnecessary to add a redundant limitation such as "the threshold is not set at zero" to the claims.

It may be conceivable to set a discard end threshold to a value equal to a read start threshold. However, the accumulation of packets would often fall below the read start threshold due to jitter or the like, and the queue would sometimes be emptied resulting in intermittent discontinuities in the reproduced voice signal. The read start threshold might be increased to avoid this shortcoming. In that case, however, it would seem meaningless to provide a discard end threshold which is different from the read start threshold.

The inventors of the present application have confirmed that the quality of voice communication can be improved by making use of a discard end threshold which is different from the read start threshold. This is because there is a difference between the discard end threshold and the read start threshold in the influence exerted upon human perception when starting a conversation and continuing a conversation.

The discard end threshold is determined to alleviate the influence of jitter during speech. In contrast to this, the read start threshold is determined to alleviate the sense of discomfort due to a delay at the start of speech. A major feature of Applicants' invention resides in the provision of a discard end threshold which is different from both the read start threshold and the discard start threshold.

These three thresholds become most effective to improve the quality of voice communication when the read start threshold is set at a length of the queue that is three times to four times as great as the standard deviation, which reflects the jitter distribution of the network. See Figure 6 of the present application's drawings and the related discussion in the text. As is apparent from Figure 6, the exhaustion ratio (solid curve 82) is close to zero if the read start threshold is greater than 3σ (σ = the above standard deviation), but sharply increases as the read start threshold falls below 3σ, while the reproduction start delay time (dash-and-dot curve 84) increases as the read start threshold rises above 4σ.

Near the bottom of page 7, the Office Action acknowledges that "the combined system (Platel - Weir) are silent to disclosing said read start point setting circuit sets the read start threshold at a length of the queue that is three time to four time as great as said standard deviation." In the next paragraph, though, the Office Action contends that

> Malek at al. disclose read start point setting circuit sets the read start threshold at a length of the queue that is time as great as said standard deviation (see figure 7, col. 7, lines 15-25, typical probability density function of inter-stream cell delay (jitter) is shown in FIG. 7.

It should be noted that the standard deviation of the Malek reference is not the standard deviation of the absolute delay of cells or packet, but the standard deviation of the inter - stream cell delay. In Malek's system, separate monomedia streams are recombined into a composite multimedia stream. The point of the reference is how to improve the inter-stream synchronization between these monomedia streams (see column 2, lines 18 to 25). The starting delay in multimedia reproduction, i.e. the absolute delay of cells or packets as received, should not pose any problem in this prior art technique. In the case of Applicants' invention, though, only one stream is handled, so that the standard deviation is the standard deviation of the absolute delay of the cells or packets. Independent claim 3 defines the standard deviation as "a standard deviation of said coded speech data that reflects a jitter distribution of the network and causes a receipt time of the communication packet to vary," and independent claims 4, 9, and 15 have similar limitations. The standard deviation of the

independent claims is not the same as the standard deviation of a composite multimedia stream.

With regard to the read start threshold and the discharge end threshold, the paragraph bridging pages 9 and 10 of the Office Action takes the position that Platel discloses:

> said switching decision circuit causing said switch to continuously select the discard processing up to said discharge end threshold set on the queue ((fig. 4. part 12 - counter for counting the number of packets to be read out; col. 8, lines 26-35 - the read start threshold is zero, applicant fails to disclose that the threshold could not be set at zero); (fig. 4, part 18 compares queue length with current size of queue, which results in either a read or a flush; col. 8, lines 57-68) (fig. 4, part 36; col. 8, lines 62-66 - otherwise the packets are sent to the modem; col. 5, line 2).

As was discussed above, the read start threshold of the invention defined by the claims is not set at zero. Even if Platel made use of a discard end threshold, a read start threshold (which is not set at zero) is not disclosed. A few prior art techniques make use of a discard start threshold, and another threshold which is different from the discard start threshold and serves as the read start threshold and the discard end threshold. An example is Japanese Patent Laid-open Publication No. 215182/1999, which is one of the cited references filed in an IDS. However, the read start threshold and the discard end threshold, if any, are always the same threshold. In other words, the technical concept of a discard end threshold as described above had not been disclosed. Without this technical concept, even in Platel, using different thresholds as the discard end threshold and the read start threshold would not have been obvious to an ordinarily skilled person.

On page 17, the Office Action comments as follows with regard to the three thresholds of the claims:

> Harrison et al. disclose a read start threshold at which said received packets should begin to be read out, a discard start threshold at which said received packets should begin to be discarded, and a discard end threshold at which said received packets should end to be discarded with respect to a length of said queue (col. 10, lines 62-67, ...)

There are two threshold levels in Harrison. When the average forwarding delay exceeds a threshold level 1, Harrison's QoS manager demotes filler traffic out of the current queue of prioritized queues. This threshold level 1 corresponds to neither of the three distinctive thresholds of the claims. When the average forwarding delay in Harrison exceeds a threshold level 2, forwarding of filler traffic out of the queue is suspended to start to discard new incoming packet flows that would normally flow into this queue. While Harrison relates to a packet transceiver, his threshold level 2 may best be compared to the discard start threshold of the present invention.

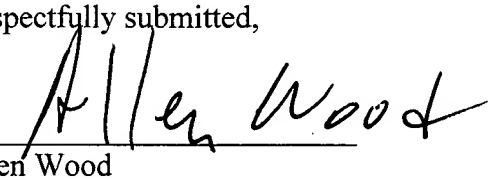
Independent claim 3 is directed to a packet receiver for receiving communication packets which contains coded speech data, decoding the communication packets, and outputting decoded speech data by the use of a queue. The body of claim 3 specifies "a read start threshold at which said received packets should begin to be read out for decoding the received packets and outputting decoded speech data," and the other independent claims have similar limitations. In contrast to this, Harrison is related to a packet transceiver for ensuring that guarantees associated with priority service by the use of prioritized queues. Platel is related to a packet transceiver in which packets of bits from asynchronous terminal equipments are multiplexed. These references are far afield from what is claimed in the present application.

Fujimoto relates to a voice recognition technology, and Weir relates to a transmission system in which both data and speech are conveyed in packet form. However, there is no disclosure in either reference about a read start threshold, a discard start threshold, and a discard end threshold which is different from the read start threshold for controlling the reading packets in a voice reproduction process.

For the reasons discussed above, it is respectfully submitted that the inventions defined by independent claims 3, 4, 9, and 15 are patentable over the cited references. The remaining claims are dependent claims that are automatically patentable along with their independent claims, so they need not be further discussed.

In conclusion, it is respectfully submitted that this application is in condition for allowance. Reconsideration of the application is therefore respectfully requested.

Respectfully submitted,



Allen Wood
Registration No. 28,134
Rabin & Berdo, P.C.
Customer No. 23995
(202) 326-0222 (telephone)
(202) 408-0924 (facsimile)

AW/ng